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EXAMINER
HUYNH, THU V

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/283,561	Applicant(s) CHALLENGER ET AL.	
	Examiner Thu V Huynh	Art Unit 2178	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-29 and 32-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6-29, and 32-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is responsive to communications: amendment file 09/05/2002 of application filed on 04/01/1999.

2. Claims 1-3, 6-29, and 32-60 are pending in the case. Claims 1, 16, 27, 42, and 53 are independent claims.

3. Claims 4-5 and 30-31 are canceled.

4. Claims 1, 3, 9, 23, 27, 29, 35, and 49 are amended.

5. The rejections of claims 9, 23, 35, and 49 under 35 U.S.C 112, second paragraph, as being indefinite have been withdraw in view of the amendment.

6. The rejections of claims 1-3, 6-8, 11, 14-15, 27-29, 32-34, 37, and 40-41 under 35 U.S.C. 102(e) as being anticipated by Challenger et al., US 6,026,413 filed 08/1997 have been withdrawn in view of the amendment.

7. The rejections of claims 4-5 and 30-31 under 35 U.S.C. 103(a) as being unpatentable over Challenger as applied to claim 1 above, and further in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493 have been withdrawn in view of the amendment.

8. The rejections of claims 9-10 and 35-36 under 35 U.S.C. 103(a) as being unpatentable over Challenger as applied to claim 7 above, and further in view of Unger et al., US 6,230,168 B1 filed 11/1997 have been withdrawn in view of the amendment.

9. The rejections of claims 12-13 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger as applied to claim 11 above, and further in view of

Sequeira, US 6,185,585 B1 filed 12/1997 have been withdrawn in view of the amendment.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 23 and 49 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 23 and 49, the limitations of this claim is unclear, since the paragraph "union between a second object and changed fragments needs to construct the second object for at least one edge which begins with the second object and determinates in the first object and for which the second object has changed" does not explain how the step of "determining if a first compound object and a second compound object embed at least one common changed fragment", as cited in the claim. More specifically, only unions of sets (empty or not) of objects are possible, not union between one object and some other objects as cited.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

(b) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1-3, 6-8, 11, 14-15, 27-29, 32-34, 37, 40-41, and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger et al., US 6,026,413 filed 08/1997 in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493.

Regarding independent claim 1, Challenger teaches the steps of:

- providing a plurality of objects, at least one of the objects including a relationship with another object in the plurality of objects (Challenger, col.3, lines 11-21, Web site provides many objects/web pages, which have relationship between objects);
- identifying at least one relationship between the plurality of objects (Challenger, col.4, lines 11-15, "a directed graph called the object dependence graph (G), which represents the data dependencies between objects");
- representing the at least one relationship between the plurality of objects using at least one graph (Challenger, col.4, lines 11-15, a directed graph called the object dependence graph (G), which represents the data dependencies between objects"); and
- traversing at least one graph to determine the order in which to construct objects in accordance with the at least one relationship and an update to at least one of the objects in plurality of objects (Challenger, col.4, lines 11-15, teaches the use of directed graph and the order in which to construct o2 as o1 has been updated. Col.4,

lines 37-40, further notes how changes to one object are propagated by the object manager and the data dependence information. Finally, col.28, lines 48-56, again explains the order of how o2 is updated according to changes applied to u2, u3 and o1, o3).

Challenger does not explicitly disclose wherein the step of traversing at least one graph to determine the order is by employing at least one topological sort. However, Challenger teaches the update propagation phase by traversing "all of the graph G accessible from the list_of_objects" using depth-first-search. Challenger also mentions that other graph traversal methods are easily adapted (Chalenger, col.22, line 64 - col.23, line 5).

Cormen mentions an example in how topology sort is used in ordering (page 485, lines 1-8 from bottom). Cormen also indicates that depth first search can be used to perform topological sort of directed acyclic graph (page 485, lines 15-17 from bottom).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined a well known traversal method such as topology sort with Challenger's system to guarantee a consistency in orderly updating objects in the topology graph, since the orderly updating of objects is important in maintaining the set of pages (objects) on a web site.

Regarding dependent claim 2, which is dependent on claim 1, Challenger and Cormen teach the limitations of claim 1 as explained above. Challenger teaches wherein the step of representing the at least one relationship between the plurality of objects includes the step of

representing objects in the plurality of objects by nodes and representing at least one relationship by at least one connection between nodes (Challenger, col.4, lines 11-15; and col.7, lines 25-30).

Regarding dependent claim 3, which is dependent on claim 1, Challenger and Cormen teach the limitations of claim 1 as explained above. Challenger further discloses the step of selecting sort criteria based on one of performance and correct construction of the plurality of objects (Challenger, col.4, lines 11-27, explains how the order of traversal is built according to the object dependencies and construction).

Regarding dependent claim 6, which is dependent on claim 1, Challenger and Cormen teach the limitations of claim 1 as explained above. Challenger teaches constructing objects based on the order (see claim 1 and 4).

Regarding dependent claim 7, which is dependent on claim 1, Challenger and Cormen teach the limitations of claim 1 as explained above. Challenger teaches publishing at least one of the plurality of objects (Challenger, col.4, lines 1-10, the server "keeps track of which versions are sent" and "maintains consistency among a set of objects". These steps imply the publication of objects for the client to access).

Regarding dependent claim 8, which is dependent on claim 7, Challenger and Cormen teach the limitations of claim 7 as explained above. The limitation of "wherein all of the at least

one of the plurality of objects are published together" is addressed under the same rationale as provide above in the rejection of claim 7.

Regarding dependent claim 11, which is dependent on claim 7, Challenger and Cormen teach the limitations of claim 7 as explained above. Challenger teaches the step wherein the step of publishing includes the step of satisfying at least one consistency constraint (Challenger, col.4 lines 41-47 and lines 6-10).

Regarding dependent claim 14, which is dependent on claim 11, Challenger and Cormen teach the limitations of claim 11 as explained above. Challenger teaches the step of satisfying at least one consistency constraint includes the step of publishing two compound objects together if the compound objects are both constructed from at least one common changed fragment (Challenger, col.9 lines 39-46 wherein the system make the determination of whether to update the compound-complex objects co1, co2 or both from the cache to publish them based on whether records (fragments) r1 or r2 has been changed.)

Regarding dependent claim 15, which is dependent on claim 1, Challenger and Cormen teach the limitations of claim 1 as explained above. Challenger teaches wherein at least one of the plurality of objects is a Web page (Challenger, col.3, lines 7-17, web pages are objects).

Claims 27-29, 32-34, 37, and 40-41 are for a computer system performing the method of claims 1-3, 6-8, 11, and 14-15, respectively and are rejected under the same rationale.

Regarding independent claim 53, Challenger teaches the steps of:

- providing a plurality of objects (Challenger, col.3, lines 11-21, Web site provides many objects/web pages); and
- constructing at least one graph, the at least one graph including nodes representing objects and edges for connecting nodes having relationships, at least some of the edges being derived from at least one consistency constraint (Challenger, col.4, lines 11-15; col.7, lines 26-30; and col.28, lines 48-65).

Challenger does not explicitly disclose the step of finding at least one strongly connected component in the at least one graph. Challenger mentions, however, that other graph traversal methods are easily adapted (Chalenger, col.22, line 64 - col.23, line 5) besides depth first search for traversal to update objects into consistent state.

Cormen teaches the step of using depth first search to perform topological sort (page 485, lines 15-17 from bottom) and to find strongly connected components (page 488, lines 20-22 from bottom and page 489, figure 23.9).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Cormen to find strongly connected components since finding strongly connected components are necessary in order to update them to consistent state together to publish.

Regarding dependent claim 54, which is dependent on claim 53, Challenger and Cormen teach the limitations of claim 53 as explained above. The limitation of "publishing a set of objects belonging to same strongly connected component group" is rejected under the same rationale as provide in the rejection of claim 53 above.

Regarding dependent claim 55, which is dependent on claim 53, Challenger and Cormen teach the limitations of claim 53 as explained above. The limitation of using "topologically storing at least part of the at least graph" is addressed under the same rationale as provide above in the rejection of claim 53.

Regarding dependent claim 56, which is dependent on claim 55, Challenger and Cormen teach the limitations of claim 55 as explained above The limitation of "examining objects in an order defined by topological sort; and when an unpublished object is examined, publishing the unpublished object together with all objects belonging to a same strongly connected component" is addressed under the same rationale a provide in the rejection of claim 55 above.

14. Claims 9-10 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Cormen as applied to claim 7 above, and further in view of Unger et al., US 6,230,168 B1 filed 11/1997.

Regarding dependent claim 9, which is dependent on claim 7, Challenger and Cormen teach the limitations of claim 7 as explained above. Challenger does not specifically disclose the steps of:

- partitioning the plurality of objects into a plurality of groups; and
- publishing all objects belonging to a same group together

Challenger does, however, emphasize the importance of keeping the updating and caching to publish of objects consistently (Challenger, col.4, lines 9-10 and lines 41-47). Challenger further teaches traversing the graph to determine which objects have changed (Challenger, col.16, lines 2-4).

Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects that included in the collections (Unger, col.4 lines 24-28). Unger discloses, however that his "technique lends itself to quickly binding structured collections of material which have some logical ordering determined by the linked structure of the components themselves" (Unger, col.4 lines 61-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified and combined Unger's method of partitioning with Challenger's system to consistently publish the updated objects to the clients, since this will help publishing of related objects in a consistent manner.

Regarding dependent claim 10, which is dependent on claim 9, Challenger, Cormen, and Unger teach the limitations of claim 9 as explained above. Challenger, Cormen, and Unger

do not explicitly teach the step for at least two of the plurality of groups, publishing all objects belonging to a first group before publishing any objects belonging to a second group.

However, the limitation of this claim on how the different groups are published is common sense and consistent with Challenger's insistency on keeping these objects in consistent states, and with Unger's use of partitions for these related objects. If objects belong to different groups are published without order, a client will run more often into broken links in attempting to access pages that belong to different groups.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Unger to publish objects that belong to the same group first before publishing objects in other groups, to provide more efficient and consistent access to pages of the same group since consistency in servicing pages is an important factor to the client's feeling about a certain website.

Claims 35-36 are for a computer system performing the method of claims 9-10, respectively and are rejected under the same rationale.

15. Claims 12-13, 38-39, and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Cormen as applied to claims 11 and 53 above, and further in view of Sequeira, US 6,185,585 B1 filed 12/1997.

Regarding dependent claim 12, which is dependent on claim 11, Challenger and Cormen teach the limitations of claim 11 as explained above. Challenger does not explicitly disclose wherein the step of satisfying at least one consistency constraint includes the step of

delaying publication of a first object until a second object which is referenced by the first object is published.

However, this step is also common sense and consistent with Challenger's insistency on keeping the objects in consistent states. In one part that is somewhat related to the limitation of this claim, Challenger teaches the step of updating (or preserving) the related records (fragments) referenced to by an object before caching to publish that particular object (Challenger, col.14 lines 46-49). Those skills in the art would have considered the second object in the limitation of this claim very similar to Challenger's fragment.

Sequeira, in col.6, lines 6-19, teaches that a second object 660 which is referenced by a first object 620 (URL 625 in first object) needs to be retrieved when the user clicks on the URL. It is highly recommended if not commendatory therefore to publish the second object 660 before publishing the first object 620 since the user will expect that the second object is retrievable. Otherwise, the URL is a broken link.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Sequeira to publish those objects that are referred to by an object before publishing that object itself, since this will allow the clients access to them in a consistent manner.

Regarding dependent claim 13, which is dependent on claim 12, Challenger, Cormen, and Sequeira teach the limitations of claim 12 as explained above. Challenger teaches wherein the first object and the second object include Web pages (Challenger, col.3, lines 11-21, teaches objects are web pages). Refer to the rationale relied to reject claim 12, the limitation of "a

reference between the first and second objects includes a hypertext link" is rejected under the same rationale as provide in the rejection of claim 12 above.

Claims 38-39 are for a computer system performing the method of claims 12-13, respectively and are rejected under the same rationale.

Regarding dependent claim 57, which is dependent on claim 53, Challenger and Cormen teach the limitations of claim 53 as explained above. Challenger does not explicitly disclose that one of the at least one consistency constraint includes delaying publication of a first object before a second object which is referenced by the first object is published.

However, this step is also common sense and consistent with Challenger's insistency on keeping the objects in consistent states. In one part that is somewhat related to the limitation of this claim, Challenger teaches the step of updating (or preserving) the related records (fragments) referenced to by an object before caching to publish that particular object (Challenger, col.14 lines 46-49). Those skills in the art would have considered the second object in the limitation of this claim very similar to Challenger's fragment.

Sequeira, in col.6, lines 6-19, teaches that a second object 660 which is referenced by a first object 620 (URL 625 in first object) needs to be retrieved when the user clicks on the URL. It is highly recommended if not commendatory therefore to publish the second object 660 before publishing the first object 620 since the user will expect that the second object is retrievable. Otherwise, the URL is a broken link.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Sequeira to publish those objects that are referred to by an object before publishing that object itself since this will allow the clients access to them in a consistent manner.

Regarding dependent claim 58, which is dependent on claim 57, Challenger, Cormen, and Sequeira teach the limitations of claim 57 as explained above. Challenger teaches wherein the first and second objects include Web pages (Challenger, col.3, lines 11-21, teaches objects are web pages). Refer to the rationale relied to reject claim 57, the limitation of "at least one edge between the objects corresponds to at least one hypertext link" is reject under the same rationale as provide in the rejection of claim 57 above.

Regarding dependent claim 59, which is dependent on claim 53, Challenger and Cormen teach the limitations of claim 53 as explained above. Challenger teaches wherein an edge exists from a first object to a second object in at least one of the at least one graphs if the second object has a reference to the first object (Challenger, col.14 lines 46-49).

Regarding dependent claim 60, which is dependent on claim 53, Challenger and Cormen teach the limitations of claim 53 as explained above. Challenger teaches wherein at least one of the consistency constraints includes publishing two compound objects together if the two compound objects are both constructed from at least one common changed fragment (Challenger, col.9 lines 39-46 wherein the system make the determination of whether to update

the compound-complex objects co1, co2 or both from the cache to publish them based on whether records (fragments) r1 or r2 has been changed).

16. Claims 16-17, 20-22, 42-43, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger et al., US 6,026,413 filed 08/1997, in view of Unger et al., US 6,230,168 B1 filed 11/1997.

Regarding independent claim 16, Challenger teaches the step of:

- providing a plurality of objects, including compound objects (Challenger, col.3, lines 11-21, Web site provides many objects/web pages. Fig.1B, object1 (co1) is a compound object, since object1 (co1) is constructed from fragments r1 and r2).

Challenger does not explicitly disclose the steps of partitioning at least some of the plurality of objects into a plurality of groups such that if two compound objects are constructed from at least one common changed fragment, then the compound objects are placed in the same group; and publishing all objects belonging to a same group together.

Challenger does, however, emphasize the importance of keeping the updating and caching to publish objects consistently (Challenger, col.4 lines 9-10 and lines 41-47). Challenger further teaches traversing the graph to determine which objects have changed (Challenger, col.16, lines 2-4).

Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects (e.g. compound objects that are constructed from at least one common changed fragment are related objects) that included in the collections (Unger, col.4 lines 24-28).

Although Unger groups objects in a different manner, it is only because he uses a different criteria. Unger discloses, however that his "technique lends itself to quickly binding structured collections of material which have some logical ordering determined by the linked structure of the components themselves" (Unger, col.4 lines 61-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Unger's method of partitioning with Challenger's system to consistently publish the updated objects to the clients, since this will help publishing of related objects that depend on a common fragment in a consistent manner.

Regarding dependent claim 17, which is dependent on claim 16, Challenger and Unger teach the limitations of claim 16 as explained above. Challenger and Unger do not explicitly teach the step for at least two of the plurality of groups, publishing all objects belonging to a first group before publishing any objects belonging to a second group.

However, the limitation of this claim on how the different groups are published is common sense and consistent with Challenger's insistency on keeping these objects in consistent states, and with Unger's use of partitions for these related objects. If objects belong to different groups are published without order, a client will run more often into broken links in attempting to access pages that belong to different groups.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Unger to publish objects that belong to the same group first before publishing objects in other groups, to provide more efficient and

consistent access to pages of the same group since consistency in servicing pages is an important factor to the client's feeling about a certain website.

Regarding dependent claim 20, which is dependent on claim 16, Challenger and Unger teach the limitations of claim 16 as explained above. Challenger further teaches the steps of:

- representing objects by nodes on at least one graph (Challenger, col.4, lines 11-15; and col.7, lines 25-30); and
- representing relationships between the objects by connections between the nodes (Challenger, col.4, lines 11-15; and col.7, lines 25-30).

Regarding dependent claim 21, which is dependent on claim 20, Challenger and Unger teach the limitations of claim 20 as explained above. Challenger does not explicitly disclose wherein the connections include an edge between two nodes representing compound objects if the two compound objects are constructed from at least one common changed fragment. Challenger discloses, however, that he represents the relationship between nodes by edges in the graph.

Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects that included in the collections (Unger, col.4 lines 24-28). Although Unger groups objects in a different manner, it is only because he uses a different criteria. Unger discloses, however that his "technique lends itself to quickly binding structured collections of

material which have some logical ordering determined by the linked structure of the components themselves" (Unger, col.4 lines 61-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Challenger and Unger to represent the relationship between two compound objects that are constructed from a common changed fragment by an edge between the two nodes (objects), since it would have helped traversing the graph to update relating objects in a consistent manner.

Regarding dependent claim 22, which is dependent on claim 20, Challenger and Unger teach the limitations of claim 20 as explained above. Challenger teaches wherein the connections include a directed edge from a first node representing a first object to a second node representing a second object, if the second object includes a reference to the first object (Challenger, col.4, lines 11-15; col.7, lines 25-30; col.9, lines 26-50; and fig.1B).

Claims 42-43 and 46-48 are for a computer system performing the method of claims 16-17 and 20-22, respectively and are rejected under the same rationale.

17. Claims 18-19 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable by Challenger in view of Unger as applied to claim 16 above, and further in view of Sequeira, US 6,185,585 B1 filed 12/1997.

Regarding dependent claim 18, which is dependent on claim 16, Challenger and Unger teach the limitations of claim 16 as explained above. Challenger does not explicitly disclose the

step of delaying publication of a first object until a second object which is referenced by the first object is published.

However, this step is also common sense and consistent with Challenger's insistency on keeping the objects in consistent states. In one part that is somewhat related to the limitation of this claim, Challenger teaches the step of updating (or preserving) the related records (fragments) referenced to by an object before caching to publish that particular object (Challenger, col.14 lines 46-49). Those skill in the art will consider the second object in the limitation of this claim very similar to Challenger's fragment.

Sequeira, in col.6, lines 6-19, teaches that a second object 660 which is referenced by a first object 620 (URL 625 in first object) needs to be retrieved when the user clicks on the URL. It is highly recommended if not commendatory therefore to publish the second object 660 before publishing the first object 620 since the user will expect that the second object is retrievable. Otherwise, the URL is a broken link.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Sequeira to publish those objects that are referred to by an object before publishing that object itself since this will allow the clients access to them in a consistent manner.

Regarding dependent claim 19, which is dependent on claim 18, Challenger, Unger and Sequeira teach the limitations of claim 18 as explained above. Challenger teaches wherein the first object and the second object include Web pages (Challenger, col.3, lines 11-21, teaches

objects are web pages). Refer to the rationale relied to reject claim 18, the limitation of "a reference between the first and second objects includes a hypertext link" is addressed.

Claims 44-45 are for a computer system performing the method of claims 18-19 respectively and are rejected under the same rationale.

18. Claims 23-26 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challenger in view of Unger as applied to claim 20 above, and further in view of Cormen et al., "Introduction to Algorithms", copyright 1990, pages 477-493.

Regarding dependent claim 23, which is dependent on claim 20, Challenger and Unger teach the limitations of claim 20 as explained above. Challenger does not disclose the steps of:

- determining if a first compound object and a second compound object embed at least one common changed fragment by:
  - topologically sorting at least part of a graph including dependence edges between objects;
  - examining the graph in an order defined by the topological sort; and
  - constructing a union between a second object and changed fragments needed to construct the second object for at least one edge which begins with the second object and terminates in the first object and for which the second object has changed.

This claim is unclear as explained in 112 rejection. However, the examiner interprets the applicant's means is for one in the art to traverse the graph after applying a topology sort to

determine that two compound objects embed at least a common changed fragment. Challenger does not explicitly disclose the use of topology sort. He mentions, however, that other graph traversal methods are easily adapted (Chalenger, col.22, line 64 - col.23, line 5) besides depth first search for traversal.

Cormen teaches the step of using topology sort to determine the order of updating (page 485 lines 1-7 from bottom, and figure 23.7 on page 486). Following his example, one skill in the art can easily determine how two objects embed a common changed fragment.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Cormen to determine if a first compound object and a second compound object embed at least one common changed fragment since this step is necessary in updating the two compound objects once a common fragment is changed.

Regarding dependent claim 24, which is dependent on claim 20, Challenger and Cormen teach the limitations of claim 20 as explained above. Challenger does not disclose the step of performing a topological sort on at least part of the at least one graph for finding strongly connected components. Challenger mentions, however, that other graph traversal methods are easily adapted (Chalenger, col.22, line 64 - col.23, line 5) besides depth first search for traversal.

Cormen teaches the step of using depth first search to perform topological sort (page 485, lines 15-17 from bottom) and to find strongly connected components (page 488, lines 20-22 from bottom and page 489, figure 23.9).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Challenger and Cormen to find strongly connected

components since finding strongly connected components are necessary in order to update them to consistent state together to publish.

Regarding dependent claim 25, which is dependent on claim 24, Challenger, Unger, and Cormen teach the limitations of claim 24 as explained above. Refer to the rationale relied to reject claim 24, the limitation of "publishing a set of object belonging to a same strongly connected component, of at least one graph, together" is also addressed.

Regarding dependent claim 26, which is dependent on claim 24, Challenger, Unger, and Cormen teach the limitations of claim 24 as explained above. The limitation of "examining objects in an order defined by topological sort; and when an unpublished object is examined, publishing the unpublished object together with all objects belonging to a same strongly connected component" is addressed under the same rationale a provide in the rejection of claim 24 above.

Claims 49-52 are for a computer system performing the method of claims 23-26 respectively and are rejected under the same rationale.

Response to Arguments

19. Applicant's arguments filed on 09/05/2002 have been fully considered but they are not persuasive.

Applicants argue with respect to amended independent claim 1 that Challenger does not disclose the feature of "topologically sorting the at least one graph to determine the order in which to construct objects in accordance with the at least one relationship and an update to at least one of the objects in the plurality of objects".

However, Challenger and Cormen teach these limitations, as explained in the rejections above.

Applicants argue with respect to claims 9, 10, 35 and 36 that the combination of Challenger and Unger fails to disclose or teach every feature of the claimed invention, without giving any explanation why they conclude so.

This is not persuasive. As already discussed in the Office Action regarding the specified claims, a combination of Unger and Challenger teaches the claimed limitations of 9, 10, 35 and 36.

Applicants argue with respect to claims 12, 13, 38, and 39 that the combination of Challenger and Sequeira fails to disclose or teach every feature of the claimed invention, without giving any explanation why they conclude so.

This is not persuasive. As already discussed in the Office Action regarding the specified claims, a combination of Unger and Challenger teaches the claimed limitations of 12, 13, 38 and 39.

Applicants argue with respect to claim 16 that Unger reveals no teaching or suggestion disclosing or motivating the applicants' claimed invention.

This is not persuasive. As already discussed in Office Action, Unger teaches the step of grouping the objects together in logical collections (partitions) for objects (pages) by traversing the link tree (Unger, col.4 lines 43-64) to facilitate accesses to related objects (e.g. compound objects that are constructed from at least one common changed fragment are related objects) that included in the collections (Unger, col.4 lines 24-28). Unger further discloses that his "technique lends itself to quickly binding structured collections of material which have some logical ordering determined by the linked structure of the components themselves" (Unger, col.4 lines 61-64). Unger's latter disclosure reveals that his technique is readily to be combined with what Challenger teaches in maintaining, updating and serving collections of object in a client/server environment. Unger's method would have helped Challenger in keeping the updating and caching to publish objects consistently (Challenger, col.4 lines 9-10 and lines 41-47).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Unger's method of partitioning with Challenger's system to consistently publish the updated objects to the clients, since this will help publishing of related objects that depend on a common fragment in a consistent manner.

Applicants argue with respect to claim 53 that the feature of "finding at least one strongly connected component in the at least one graph" is nowhere disclosed in the cited

references and that there was no motivation to have modified and combined Challenger's and Cormen's.

This is not persuasive. Challenger teaches the step of constructing and traversing the graph (Challenger, col.4, lines 11-15; col.7, lines 26-30; and col.28, lines 48-65). He further teaches that that other graph traversal methods are easily adapted (Chalenger, col.22, line 64 - col.23, line 5) besides depth first search for traversal to update objects into consistent state. Cormen teaches the step of using depth first search to perform topological sort (page 485, lines 15-17 from bottom) and to find strongly connected components (page 488, section 23.5 and page 489, figure 23.9, "finding strongly connected component of a graph"). As disclosed on page 488, lines 8 to 1 from bottom, Cormen's method is to find dependency among objects.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Cormen's method of traversal and finding strongly connected components into Challenger's system in order to update them to consistent state together to publish.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu v Huynh whose telephone number is (703) 305-9774. The examiner can normally be reached on Monday through Friday, except the second Friday of each bi-week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather R Herndon can be reached on (703) 308-5186. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications (703) 746-7238 for After Final communications, and (703) 746-7240 for Non-Official/Draft.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9000.

TVH
October 30, 2002

STEPHEN S. HONG
PRIMARY EXAMINER